

## Description of a New Species of *Trjapitzinellus* Parasitic on Coniopterygidae in California<sup>1, 2</sup>.

(Hymenoptera: Encyrtidae; Neuroptera)

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Slides in the collection of the Citrus Experiment Station, University of California, Riverside, indicate the presence of a new species of encyrtid from California as suspected by P. H. Timberlake in 1928. Subsequent collections by Paul DeBach and Harold Compere in southern California during the 1930's and 1940's revealed more individuals similar to Timberlake's material. Intensive collecting by J. A. McMurtry during the 1960's associated the parasite with species of *Conwentzia* and *Parasemidalis* (Coniopterygidae). Owing to the taxonomic status of the Bothriothoricini (= Mirini Ashmead), no attempt was made by Timberlake, Compere, or DeBach to describe the species. Recently, Viggiani (1967) described a genus of encyrtid parasitizing Coniopterygidae in southern Italy which is congeneric with the material collected by DeBach, Compere, and Timberlake. Research by R. Malone on synecological aspects of *Trjapitzinellus microrphanos*, sp. nov., necessitates description of this species.

### ***Trjapitzinellus microrphanos* Gordh, new species**

FEMALE.—Body length 2.3 mm. Head, mesosoma, gaster blackish brown; malar space, face with mauvish refringence; antennal scape reddish brown, remaining segments lighter; wings hyaline, without infuscation; coxae, femora, basal half of tibiae concolorous with body; trochanters, apical portion of tibiae, tarsi tan.

Head hypognathous, in dorsal aspect more than twice as wide as median length; anterior margin transverse; posterior margin concave between compound eye; frontovertex (at narrowest) about  $\frac{1}{4}$  head width; ocelli forming acute triangle, lateral ocelli touching inner margin of compound eyes; median ocellus in center of frontovertex lateral ocelli less than diameter of one ocellus from posterior margin. Frontal aspect of head (Figs. 4, 5) triangular, compound eye height slightly greater than malar space; toruli at ventrolateral margin of clypeus, separated by 4 times diameter of single torulus; scrobe indistinct, interantennal ridge not conspicuous; inner margin of compound eye with conspicuous line of setae extending along inner margin of subocular suture, ending beneath torulus. Antenna 11-segmented (Fig. 2); scape with ventral flange; pedicel twice longer than first

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<sup>1</sup> I am grateful to D. P. Annecke, Plant Protection Institute, Pretoria, Republic of South Africa, for comparing the material with his collection of African Encyrtidae and V. Trjapitzin, Soviet Academy of Science, Leningrad, for comparison with the Palearctic material at his disposal; Harold Compere kindly provided access to his extensive collection of Encyrtidae. Professor C. D. Michener, University of Kansas, Lawrence, reviewed the manuscript and suggested improvements.

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flagellomere; flagellomeres uniformly setose with few carinae, becoming progressively larger distally; club compact, setose, with curved sensory margin dorsad. Head lightly shagreened, compound eye with uniform covering of short setae; mandibles tridentate; maxillary palp 4-segmented (Fig. 7), labial palp 3-segmented (Fig. 6).

Mesosoma (Fig. 8) twice as long as wide; dorsal surface flattened. Mesoscutum, scutellum, axilla lightly shagreened; tegula strongly shagreened, setose; propodeum with few coarse striations; mesoscutum with uniform vestiture of pale thin setae; scutellum with longer, more irregularly dispersed setae; axilla, metanotum, propodeum asetose. Legs not modified; middle tibial spur (Fig. 3)  $\frac{2}{3}$  length of basitarsus and subequal length. Forewing (Fig. 9) about  $2\frac{1}{3}$  times longer than greatest width, lacking infuscation; submarginal, marginal vein limits not evident, forming single straight vein, with marginal vein distinct distally; costal cell well-developed, setose; postmarginal vein at least as long as stigmal vein, terminus indistinct; speculum present, but lateral margins not straight or distinct; hindwing (Fig. 10) with submarginal, marginal veins subequal, submarginal vein arched forward; entire wing surface distal to imaginary line perpendicular to union of marginal and submarginal veins covered with setae of uniform length.

Gaster shorter than mesosoma, rounded at apex, ovipositor and gonostylus not visible from above; ovipositor and hind tibia subequal in length.

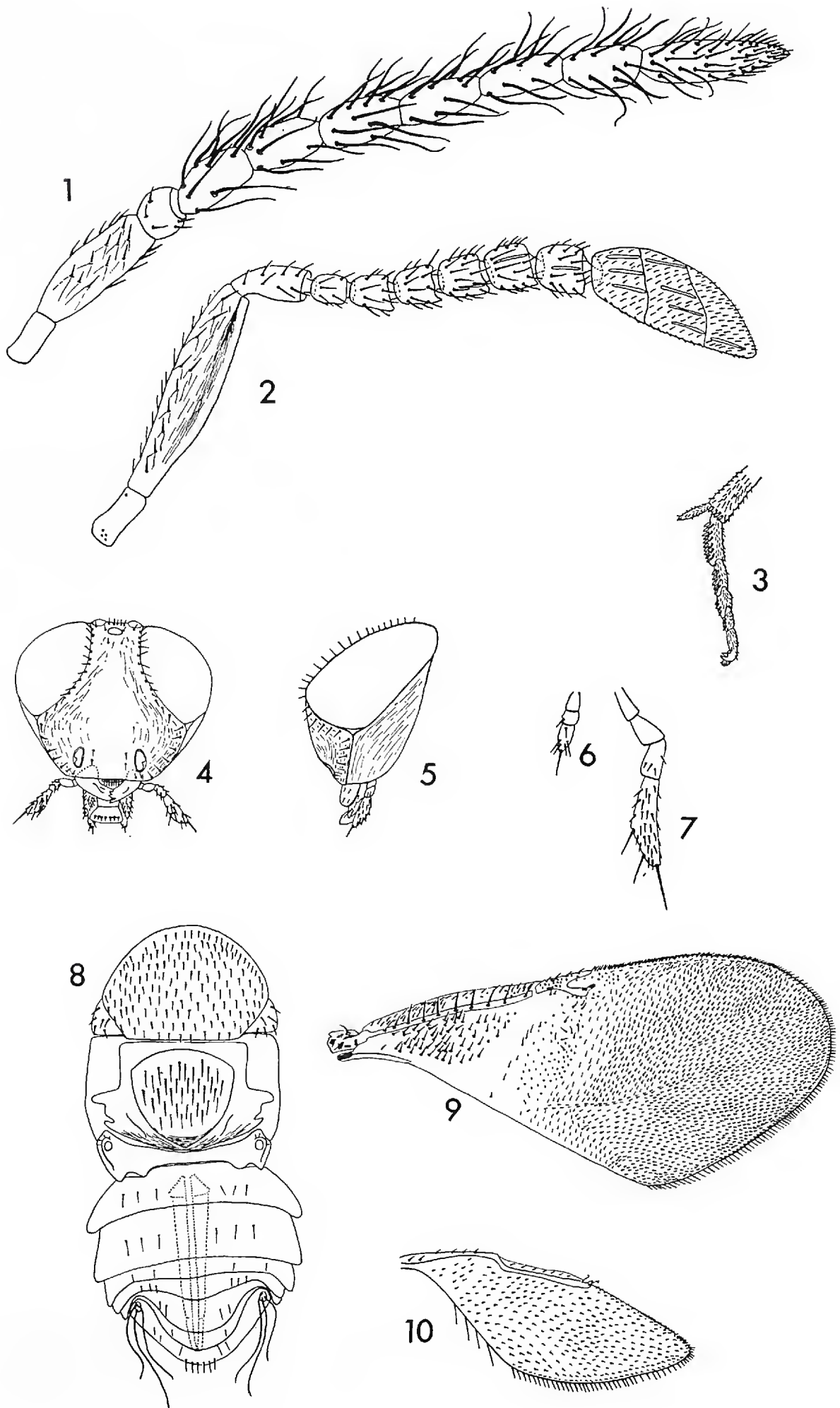
MALE.—Body length 2.0 mm. Color as female except antenna light brown with reddish refringence. Head shape as female; ventral margin of antennal torulus above clypeal margin by height of one torulus. Antenna (Fig. 1) 9-segmented; six flagellomeres subequal in size, twice as long as wide. Aedeagus exerted subequal in length to hindbasitarsus and second tarsomere.

BIOLOGICAL ASSOCIATIONS.—Fleschner and Ricker (1953) indicate four genera of coniopterygids are found in southern California, *Parasemidalis*, *Conwentzia*, *Coniopteryx*, and *Malacomyza*. *Parasemidalis flaviceps* Banks and *Conwentzia nigrans* Carpenter are most abundant in citrus groves. Preliminary studies by McMurtry indicate *T. microrphanos* parasitizes *Conwentzia* sp. and *Parasemidalis* sp. during the larval stage before the cocoon is spun. The parasite pupates within the prepupal skin of its host.

COMPARATIVE COMMENTS.—In his generic description, Viggiani (1967) relied upon the observations of Trjapitzin in establishing affinities between *Trjapitzinellus* and related bothriothoracines. Trjapitzin supposed the genus to be related to *Aphidencyrtus* Ashmead, *Aphiden-*

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FIG. 1. Inner aspect left antenna ♂ *T. microrphanos* ( $\times 45$ ). FIG. 2. Inner aspect left antenna ♀ *T. microrphanos* ( $\times 45$ ). FIGS. 3–10. ♀ *T. microrphanos* ( $\times 40$ ): FIG. 3. Right tibiotarsus, FIG. 4. Head anterior aspect, FIG. 5. Head lateral aspect, FIG. 6. Left labial palpus, FIG. 7. Left maxillary palpus, FIG. 8. Dorsal view of meso- and metasoma, FIG. 9. Right forewing, and FIG. 10. Right hindwing.



*cyrtoides* Ishii, *Baeonusia* Girault, *Geniaspidius* Masi, *Mercetencyrtus* Trjapitzin and *Ooencyrtus* Ashmead. Viggiani added that on the basis of body shape *Trjapitzinellus* is intermediate between *Ooencyrtus* and *Psyllaephagus*. Comparison of *T. microrphanos* with Compere's collection of encyrtids confirms Viggiani's suspicions. However, the systematic position of *Trjapitzinellus* is still unsatisfactory and revision of the Bothriothoracini seems essential before relationships are established. Perhaps the most distinctive feature of *T. semidaliphagus* Viggiani and *T. microrphanos* is the dorsal curved sensory margin of the female's antennal club.

Biologically, *T. semidaliphagus* has been recovered from *Semidalis aleurodiformis* Steph. in southern Italy only.

Both sexes of *T. microrphanos* may be distinguished from *T. semidaliphagus* on the basis of the following characters: (1) the distal end of the marginal vein of the forewing is broken in *T. microrphanos*, but continuous in *T. semidaliphagus*; (2) the forewing of *T. microrphanos* bears setal tracts absent from *T. semidaliphagus*; and (3) *T. semidaliphagus* lacks the conspicuous line of setae extending along the inner margin of the compound eye and subocular suture. The second segment of the female maxillary palpus of *T. microrphanos* is glabrous while the corresponding segment of *T. semidaliphagus* bears setae.

MATERIAL EXAMINED.—CALIFORNIA: San Diego Co., 13 ♀, 8 ♂, Pauma Valley, 26 March 1963, leg. J. A. McMurtry ex. coniopterygid from citrus; 11 ♀, 3 ♂, El Toro, 20 July 1964, J. A. McMurtry from coniopterygid on citrus. Orange Co.: 17 ♀, 7 ♂, Santa Ana Canyon, 9 July 1963, from coniopterygid on citrus, J. A. McMurtry. Santa Barbara Co.: 1 ♀, 2 ♂, 6 February 1964, Carpinteria, from coniopterygid on Avocado, L. Bailard; 5 ♀, 3 ♂, Santa Barbara, 25 July 1964, from coniopterygid on citrus, J. A. McMurtry. Ventura Co.: 5 ♀, 3 ♂, Ladera Ranch, Fillmore, 16 May 1963 and 2 August 1963, from coniopterygid on citrus, J. A. McMurtry. San Bernardino Co.: 4 ♀, 2 ♂, Redlands, 24 July 1963, from coniopterygid on citrus, J. A. McMurtry. Riverside Co.: 4 ♀, 1 ♂, Riverside, 10 May 1963, from coniopterygid on citrus, J. A. McMurtry.

*Holotype female and allotype*, LADERA RANCH, FILLMORE, VENTURA COUNTY, CALIFORNIA 2 August 1963, Coniopterygidae on citrus, J. A. McMurtry, Collector, both card-point mounted.

PARATYPES.—3 ♀ and 3 ♂, Santa Ana Canyon; 1 ♀, Riverside; 7 ♀ and 4 ♂, Pauma Valley; 1 ♀, Redlands; 1 ♀, Santa Barbara; 1 ♂, Fillmore; all card-point mounted.

DISPOSITION OF TYPES.—(Names in parentheses indicate individual to whom material was sent.) Holotype, Allotype, 1 ♀ and 1 ♂ Paratypes, Snow Entomological Museum, University of Kansas, Lawrence, Kansas (G. W. Byers). Paratypes have been assigned to the following institutions: 2 ♀ and 1 ♂, U.S.



National Natural History Museum (B. D. Burks); 1 ♀ and 1 ♂, Plant Protection Research Institute, Pretoria, Republic of South Africa (D. P. Annecke); 1 ♀ and 1 ♂, British Museum (Natural History), London, England (G. A. Kerrich); 1 ♀ and 1 ♂, Zoological Institute, Soviet Academy of Sciences, Leningrad, USSR (V. A. Trjapitzin); 1 ♀ and 1 ♂, Department of Entomology, University of California, Riverside, California.

#### LITERATURE CITED

- FLESCHER, C. A. AND D. W. RICKER. 1953. Food habits of coniopterygids on citrus in southern California. *Econ. Entomol.*, 46: 458-461.
- VIGGIANI, G. 1967. Recherche sugli Hymenoptera Chalcidoidea XIII. Sugli entomoparassiti della *Semidalis aleurodifformis* Steph. (Neur. Coniopterygidae), con descrizione di un nuovo genere di Encyrtidae. *Boll. Lab. Ent. Agr. Portici*, 25: 164-175.

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#### BOOK REVIEW

PRINCIPLES OF INSECT CHEMOSTERILIZATION. Edited by Germain C. La Brecque and Carrol N. Smith. Appleton-Century-Crofts, New York. 354 p., 13 figs., 32 tables. 1968. \$16.00.

This is the first comprehensive survey of chemosterilization for population control in insects. Nine contributors, eight from the U. S. Department of Agriculture and one from the U. S. Public Health Service cooperated in producing the seven chapters.

In Chapter 1, A. W. Lindquist introduces the topic by evaluating insects as pests, reviewing the current methods of control, and introducing the sterile-male concept. Chapter 2 by E. F. Knipling presents the theoretical background for sterilizing and releasing laboratory reared insects among natural populations and for direct field sterilization of portions of natural populations. Germain C. La Brecque discusses in Chapter 3 the laboratory procedures for screening chemosterilants, testing their quantitative effects by different methods of application, and determining field potential from detailed studies of the effects of a sterilant in or on an insect. In Chapter 4, Leo E. La Chance, David T. North and Waldemar Klassen discuss the basis of chemosterility at the cellular and cytogenetic levels. Ralph B. Turner presents a summary of the physical and chemical properties of some representative groups of chemosterilants and their biochemistry in Chapter 5. Field studies and evaluations of chemosterilants on specific insects (e.g., House fly, Screwworm, Cabbage looper, Boll weevil, Mosquitoes) and the use of chemosterilants as a tool in basic biological studies of insect reproductive behavior and population structure and dynamics are presented in Chapter 6 by D. E. Weidhaas. In Chapter 7 Wayland J. Hayes, Jr. reviews information on aspects of mammalian toxicity of chemosterilants for use in insect population control.

Each chapter is followed by its own set of references and a terminal index to the volume is provided. This book is an invaluable review which deserves a place on the bookshelves of all those interested in possible alternatives to pesticides as methods of controlling insect populations.—ROBBIN W. THORP, *University of California, Davis*, 95616.